Amendments to the Claims

1. (Currently amended) A vault shaped sputtering target, comprising:

a principal target comprising a material to be sputtered in opposition to a substrate to be sputter deposited and including a cylindrically shaped sidewall and a disk shaped roof forming therebetween a cylindrical vault generally symmetric about a central axis and downwardly facing said substrate;

magnetic means positioned outside of said cylindrically shaped sidewall and extending around said central axis but not extending above a plane extending perpendicular to said central axis at a back of said roof and providing inside of said sidewall a magnetic field of a first magnetic polarity extending along said central axis; and

a magnetron positioned in back of said disk shaped roof and rotatable about said central axis and comprising a first magnetic assembly of a second magnetic polarity along said central axis opposite said first magnetic polarity and a second magnet assembly of said first magnetic polarity surrounding said first magnet assembly.

2. (Canceled)

3. (Currently amended) The target of claim [[2]] 1, wherein said magnetic means comprising a plurality of magnets arranged around an exterior of said sidewall and having said ~~second~~ first magnetic polarity.

4. (Canceled)

5. (Original) The target of claim 1, wherein said magnetic means comprise horizontally arranged magnets.

6. (Original) The target of claim 1, wherein said magnetic means comprises a plurality of permanent magnets arranged in a circle about said central axis.

7. (Original) The target of claim 1, further comprising a plate comprising said material and partially closing a throat of said cylindrical vault opposite said roof.

8. (Previously presented) A sputtering reactor, comprising:

a vacuum chamber arranged about said central axis and sealed at one end by the target of claim 1; and

a pedestal within said vacuum chamber for supporting a substrate in opposition to said target to be sputter deposited with said material.

9. (Previously presented) The target of claim 1, wherein said magnetic means do not extend beyond a front sputtering surface of said roof.

10. (Previously presented) The target of claim 1, wherein a sputtering surface of target without any apertures therethrough continuously comprises said material.

11. (Previously presented) The reactor of claim 8, further comprising an anode biasable with respect to said target for supporting a plasma and disposed on a side of said target facing said pedestal.

12. (Currently amended) A vault shaped sputtering target assembly, comprising:

a principal target having a sputtering surface without any apertures therethrough, comprising a material to be to be sputter deposited on a substrate, and including a cylindrically shaped sidewall and a downwardly facing disk shaped roof forming therebetween a cylindrical vault generally symmetric about a central axis;

an array of magnets annularly arranged about said central axis, having a first magnetic

polarity along said central axis, positioned outside of said cylindrically shaped sidewall, but not extending above a plane extending perpendicular to said central axis and along said sputtering surface of said roof; and

a magnetron positioned in back of said disk shaped roof and rotatable about said central axis, wherein said magnetron comprises a first magnet assembly of a second magnetic polarity opposite said first magnetic polarity and a second magnet assembly of said first magnetic polarity and surrounding said first magnet assembly.

13. (Canceled)

14. (Previously presented) A sputtering reactor, comprising:

a vacuum chamber arranged about said central axis and sealed at one end by the target assembly of claim 12;

a pedestal within said vacuum chamber for supporting a substrate in opposition to said target to be sputter deposited with said material.

15. (Previously presented) The sputtering reactor of claim 14, further comprising an anode disposed about said central axis between said target and said pedestal, wherein said target is biasable as a cathode with respect to said anode.

16. (Previously presented) The sputtering reactor of claim 15, wherein said magnetron comprises a first magnet assembly of a second magnetic polarity opposite said first magnetic polarity and a second magnet assembly of said first magnetic polarity and surrounding said first magnet assembly.

17. (Currently amended) Previously presented) A sputter reactor, comprising:

a vacuum chamber arranged about a central axis;

a pedestal within said vacuum chamber for supporting a substrate;

a principal target sealed to but electrically isolated from said vacuum chamber, having a sputtering surface without any apertures therethrough comprising a material to be to be sputter deposited on said substrate, and including a cylindrically shaped sidewall and a downwardly facing disk shaped roof forming therebetween a cylindrical vault generally symmetric about said a central axis;

an array of magnets annularly arranged about said central axis, having a first magnetic polarity along said central axis, positioned outside of said cylindrically shaped sidewall, but not extending above a plane extending perpendicularly to said ~~central~~ central axis and adjacent to a sputtering surface of said roof;

a magnetron positioned in back of said disk shaped roof and rotatable about said central axis, wherein said magnetron comprises a first magnet assembly of a second magnetic polarity opposite said first magnetic polarity and a second magnet assembly of said first magnetic polarity and surrounding said first magnet assembly; and

an anode arranged about said central axis between said target and said pedestal, wherein said target is electrically biasable with respect to said anode.

18. (Canceled)